Chapter 10   Discussion

This thesis reports the results of studies into the determinants of ecstasy use and harm reduction strategies. In this discussion, the determinant configurations identified in this thesis will be summarized. In addition, limitations of the studies and the implications of the results for future research will be discussed. First, however, the results reported in each chapter will be summarised and the logic behind each consecutive study will be addressed.

Overview

Chapter 1 illustrated how ecstasy has become one of the most prevalent party drugs, which in combination with its potential harmfulness and the inefficacy of legislative measures that is evidenced by its prevalence, justifies development of health promotion interventions aiming to regulate its use. Then, the results were provided of a needs assessment that clarified the specific behaviours to be addressed in such interventions. The following behaviours were identified: trying out ecstasy; ceasing ecstasy use; refusing offered ecstasy; not using more than once every four to six weeks; not using more than 1.5 mg MDMA per 1 kg of bodyweight; getting ecstasy pills tested at a testing facility before use; sleeping at least eight hours in the three nights before use; drinking two litres of water on each of the three days before use; drinking half a litre of water hourly during use; chilling out for at least 20 minutes every two hours during use; and not combining ecstasy with alcohol, cocaine, speed or GHB. Identification of the determinant configurations of each of these behaviours is prerequisite to the development of an evidence-based intervention addressing any of these behaviours.

Synthesising the literature

To synthesise the state of the art regarding the determinant configurations of the these behaviours identified in the needs assessment, a meta-analysis was conducted [35], and its results are reported in chapter 2. Although this meta-analysis' database query was deliberately designed to include publications about all behaviours related to ecstasy use, only publications addressing the behaviour 'using ecstasy' were found. Through quantitative synthesis of these studies, the determinant configuration of 'using ecstasy' emerged. The most relevant determinants were attitude (specifically positive outcomes regarding mood control and social facilitation, and negative outcomes regarding escalating use and physical and mental side effects); subjective and descriptive norms regarding one's friends, partner and peers; perceived control regarding obtaining ecstasy and control in relation to being with friends who use, going out dancing, being offered ecstasy and ecstasy being available; habit; moral norm; and anticipated regret. This determinant configuration provides an evidence base for interventions addressing the behaviour "using ecstasy". However, it cannot guide interventions that target any of the behaviours that were identified in the needs assessment. Although it could be argued that the behaviour 'using ecstasy' is a generic behavioural category that encompasses specific behaviours (e.g. trying out ecstasy, ceasing ecstasy use, and using less frequently), determinant configurations of related but different behaviours may differ [30; 32; 84]. This meta-analysis therefore suggests that the literature lacks a reliable evidence base for interventions addressing any of the behaviours suggested by the needs assessment.

Because of its quantitative nature, this meta-analysis employed very severe inclusion criteria. These inclusion criteria may have caused exclusion of studies that contain valuable non-quantitative information about potential determinants of a behaviour. To address this possibility, a qualitative review was conducted that summarised all studies into the reasons of ecstasy use and related behaviours that were excluded by the meta-analysis. The results were reported in chapter 3. This review indicated that there are different reasons for starting ecstasy use, ceasing ecstasy use, using ecstasy, and other related behaviours. This suggests that the determinant configurations of starting or ceasing ecstasy use do differ from that of using ecstasy. Furthermore, for those reasons that were reported both in the qualitative review and in the meta-analysis, results sometimes diverged: although most did, not all reasons that were reported frequently in the review corresponded to beliefs that were

meaningfully associated to intention of behaviour in the meta-analysis (i.e. Cohen's d < .2 [109]).

Regarding the current aim of developing an intervention to minimise ecstasy-related harm, two lessons emerge from the meta-analysis and the review. First, only the determinant configuration of the behaviour 'using ecstasy' has been studied quantitatively. Second, this determinant configuration need not be predictive of the determinant configurations of other behaviours. Because the literature provides no evidence base regarding the determinant configurations of the behaviours specified by the needs assessment, new research is required to map these determinant configurations and thereby enable evidence-based intervention development.

The situation in the Netherlands

Of the 32 studies into determinants or reasons of ecstasy use published so far, only two had been conducted in the Netherlands. Both Dutch studies only addressed outcome expectancies. Almost all other studies had been conducted in the United States (US), the United Kingdom (UK), and Australia, and these results may not generalise to the Netherlands for two reasons. First, the Netherlands have traditionally had a more liberal drug policy than other countries, especially compared to the US [120-123]. This less repressive policy (e.g. people who get arrested for ecstasy possession are not prosecuted unless the amount of ecstasy implies dealing) allowed harm reduction initiatives to flourish [123]. In this environment, drug use patterns may well differ from those in other countries, particularly with regards to the application of harm reduction strategies (HRSs). Second, the palette of dance drugs in the Netherlands is different from that in other countries. Methamphetamine use, for example, while prevalent in Australia [125] and having been described as an 'epidemic' in the US [126], is virtually nonexistent in the Netherlands [127; 128]. LSD use shows a similar but less pronounced pattern [38; 112]. As recreational drugs have been shown to be each others substitutes [129], these differences in drug prevalences may well impact ecstasy use patterns. Because of this questionable generalisability, it is not known whether new research in the Netherlands can use the results from the previous studies synthesised in chapters 2 and 3 as a starting point. Thus, although mapping determinant configurations requires quantitative research (qualitative data precludes assessment of the relative association strengths of determinants with intention or behaviour), it nonetheless seemed expedient to first conduct a qualitative

study to assess whether ecstasy use patterns in the Netherlands are similar to those in the US, UK and Australia.

There is another reason why a qualitative study seemed expedient. In chapter 3, one of the most frequently reported reasons for cessation is a loss of interest, change in life circumstances, or interference with 'normal life'. This implied that at least a number of ecstasy users cease ecstasy use automatically. In addition, the most relevant determinants of 'using ecstasy' identified in chapter 2 appear to comprise mostly beliefs that seem hard to influence. If the determinant configuration of 'using ecstasy' does turn out to be similar to that of 'ceasing ecstasy', this might imply that it is also hard to induce cessation. Finally, the only published intervention so far aimed to reduce ecstasy use, but found the intervention to be no more successful than the control condition [83]. Together, these three observations suggest that for most users, cessation is a consequence of loss of interest or changing life circumstances. If this would be confirmed for the Netherlands, an intervention aiming to minimise ecstasy-related harm should definitely focus on promotion of harm reduction strategies (HRSs) rather than on promoting cessation.

A qualitative interview study was conducted among 32 Dutch dance scene participants, and the results are reported in chapter 4. This study showed that ecstasy use patterns in the Netherlands indeed appeared similar to those in the US, UK and Australia. In addition, it revealed that cessation of ecstasy use appeared to occur mostly automatically when users moved to what they themselves described as 'the next phase'. The first finding meant that the determinants constituting the determinant configuration of 'using ecstasy' may provide a useful starting point for quantitative studies mapping the determinant configurations of the behaviours suggested by the needs assessment. The second finding implied that it seems unwise to develop interventions that aim to induce ecstasy use cessation. Large-scale quantitative verification is needed to further inform a decision as substantial as whether or not to target cessation. All in all, the three studies reported in chapters 2, 3 and 4 summarised all research into the determinants of and reasons for ecstasy use and related behaviours so far. They established that none of the behaviours suggested by the needs assessment has been studied; indicated that determinant configurations of related but different behaviours may differ. They also indicated that the results, although mainly obtained in the US, UK and Australia, appear to generalise to the Netherlands. Finally, they indicated that cessation likely occurs automatically for most users, without the need (or

possibility) for an intervention. These results served as the basis for a large-scale quantitative study to map the determinant configurations of the behaviours suggested by the needs assessment.

Party Panel

To map the determinant configurations of each of the 14 behaviours suggested in the needs assessment (see Table 1.1), an online survey was conducted. To enable comparison of the determinant configurations of these behaviours with that of 'using ecstasy', this behaviour was also included. The online survey was powered by a flexible content-management system, the information architecture of which is illustrated in Appendix 10.i. This particular combination of technologies enabled the combination of two important aspects of the survey. On the one hand, the survey could be tailored in great detail. On the other hand, in contrast to most HTML-based tailored survey, the entire survey was presented in a Flash interface. This enabled survey administration by a self-chosen animated interviewer (participants could choose from two male and two female interviewers) in a context that consisted of pictures of dance events, while dance music played. This contextual resemblance of situations to which most questions in the survey pertained is relevant to optimise validity of the answers. In addition, the use of a self-chosen virtual agent was thought to increase commitment. Finally, by making the questionnaire more pleasant, we hoped to minimize attrition. In communication with the participants, the survey was called 'Party Panel'.

The tailoring functionality made it possible to measure some variables for all participants and some variables only for participants who satisfied a specified criterion (e.g. present different questions to ecstasy users, non-users and ex-users). This functionality was required because it would take hours to measure all potentially relevant determinants for all 15 behaviours. Tailoring enabled streaming participants into 1 of 15 cells, each of which corresponded to a behaviour. Only non-users were asked questions about 'trying out ecstasy', and no non-users were asked questions about 'ceasing ecstasy use', 'moderating use frequency', 'moderating use intensity' and combining ecstasy with alcohol, speed, coke and GHB. Ex-users were only asked questions about 'using ecstasy', 'ceasing ecstasy use' and 'refusing offered ecstasy'. With around 7000 participants, this resulted in 25 subsamples of on average 280 participants each. This first measurement (t_1) was followed by follow-ups after three (t_2) and eight (t_3) months. In the first follow-up questionnaire (t_2), participants were again streamed into different cells, to measure determinants of a different behaviour.

However, because of anticipated drop-out, proportionally more participants were streamed into the cells of 'trying out ecstasy', 'ceasing ecstasy use', and 'using ecstasy'. For non-users and ex-users, therefore, only one subsample attained acceptable size: 'trying out ecstasy' and 'ceasing ecstasy use', respectively. For users, only the subsamples of 'ceasing ecstasy use', 'moderating use frequency', and combining with coke, speed and alcohol attained acceptable sizes. Thus, at the first follow-up, seven additional subsamples were generated. In the current thesis, the results from five of the total of 32 subsamples were reported.

In chapter 5, the determinant configurations of using ecstasy in a sample of non-users, a sample of ecstasy users, and the combined sample are reported. In chapter 6, the determinant configuration of trying out ecstasy in a sample of non-users is reported. In chapter 7, the determinant configurations of ceasing ecstasy use in a random sample of users and a sample of less persistent users are reported. In chapter 8, the results are reported of a study that compared these determinant configurations. These results indicated that the determinant configurations of all three behaviours were different. Although the determinant configurations of trying out ecstasy and using ecstasy were quite similar among non-users, the determinant configurations of using ecstasy and ceasing ecstasy use were different among ecstasy users. In addition, the determinant configurations of using ecstasy were different for non-users than for users.

This suggests that whereas results from studies into the determinants of using ecstasy may provide some evidence as to determinants are relevant (but only when samples comprised exclusively non-users), results from studies into the determinants of using ecstasy cannot be considered as evidence base for interventions targeting cessation (not even when samples comprised exclusively users). When a determinant distinguished between non-users and ecstasy users, it did not always predict intention to use in any of the two groups. This suggests that studies comparing non-users and users cannot inform intervention development regarding trying out ecstasy or ceasing ecstasy use.

Regarding ceasing ecstasy use, the determinants explained at most 34% of the variation in intentions. Combined with the results of the qualitative study, this indicates that relevant determinants have not been measured. This is consistent with the possibility that users cease ecstasy use due to factors such as a loss of interest or a change in life circumstances. Further evidence for this is provided in chapter 7, where ex-users were asked by they had ceased using

ecstasy: the most endorsed reason was "I have gone to another life phase" (endorsed by 16 ex-users, 42% of the cases). The results of the syntheses of the literature, the interview study, and these quantitative results all suggest that most ecstasy users cease their ecstasy use after a number of months or years without the need for an intervention. This implies that evidence-based interventions aiming to minimise ecstasy-related damage may be more efficient if they aim to promote harm reduction strategies (HRSs) rather than cessation. Therefore, there is a need to map the determinant configurations of harm reduction strategies to enable evidence-based intervention development.

Although the literature offers no comparison of HRSs in terms of their beneficial health effects, of those listed in the needs assessment reported in chapter 1, getting ecstasy tested at a testing facility is regarded as the most important one by experts from the field (see Appendix 10.i). Testing facilities constitute the only means of ascertaining the exact content of an ecstasy pill. Doing so can prevent two potential risks. First, pills sold as ecstasy can contain other drugs or even poison. This is very dangerous, because when a pill contains, for example, 100 mg of methamphetamine, this is likely to result in severe neurotoxicity or even death [16]. Of course, the damage that unidentified poisoned pills could cause speaks for itself. Second, even if a pill contains solely MDMA, dosage may vary between a few to over 200 milligrams. This is dangerous because users who normally have pills of low dosage (e.g. 30 mg) may habitually take three or four pills simultaneously to ingest the desired dosage of MDMA. If they buy new pills from a more potent batch (e.g. 120 mg) without being aware of the increased potency, they are likely to ingest three or four pills as usual, thereby exposing themselves to an exceptionally high dosage of MDMA.

Because it seems that interventions should aim at promoting harm reduction strategies, and because getting ecstasy tested at a testing facility seems a very important harm reduction strategy, it seems very important to map the determinant configuration of getting ecstasy tested. In chapter 9, data allowing the mapping of this determinant configuration is reported, and additionally, results of a small-scale exploratory study. The determinant configuration itself is reported in the next section. Regarding the exploratory measures, it appeared that most participants estimated the proportion of adulterated pills to be higher than this was in reality. In addition, a substantial proportion of participants expected adulterated pills to contain poison. Yet, many participants were willing to consume untested pills, particularly when

friends claimed to have used pills from the same batch already. Perceived susceptibility of obtaining adulterated pills thus seemed very low.

Determinants of ecstasy use and harm reduction strategies

The studies reported in this thesis mapped the determinant configurations of trying out ecstasy, ceasing ecstasy use, and getting ecstasy tested at a testing facility. For all three behaviours, prior intention to perform that behaviour strongly predicted whether the behaviour was indeed performed. This confirmed the value of mapping these determinant configurations, which are shown in Table 10.1. Regarding trying out ecstasy, attitude, moral norm and anticipated regret have strong associations with intention to try out ecstasy, and subjective norm and the expectation that ecstasy makes one feel very good have moderate associations with intention. Regarding ceasing ecstasy use, only attitude is associated strongly to intention to cease, and subjective norm and the expectation that ecstasy damages one's health have moderate associations with intention. Regarding getting ecstasy tested, habit iss associated to intention very strongly. Attitude, descriptive norm, and anticipated regret have strong associations, and perceived behavioural control has a moderate association.

    Although these association strengths can guide intervention development, they should not be considered a sufficient evidence base. This information should be complemented with information about the determinants' changeability. The resulting selection of determinants can then guide intervention development. In Intervention Mapping, this resulting selection of determinants should be crossed with the so-called performance objectives that underlie the target behaviours. A performance objective is defined as a subbehaviour at the lowest meaningful level of specification (e.g. for testing ecstasy, a performance objective could be 'calling the testing facility to make an appointment to deliver a pill'). The resulting matrix is the matrix of change objectives: from the combination of each performance objective with each determinant emerge concrete intervention targets called change objectives. An example of such a change objective for the performance objective 'calling the testing facility to make an appointment to deliver a pill' and the determinant 'perceived behavioural control' would be to 'express confidence in one's ability to call to make an appointment to get ecstasy tested'.

    These concrete, explicit change objectives can then be targeted by an intervention. Of course, this knowledge of *what* to change does not help one in

Table 10.1: Determinant configurations of trying out ecstasy, ceasing ecstasy use, and getting ecstasy tested.

	Relevance*		
Determinant	Trying out ecstasy	Ceasing ecstasy use	Getting ecstasy tested
Traditional TPB determinants			
Attitude	+ + +	+ + +	+ + +
Subjective norm	+ +	+ +	+
Perceived behavioural control	+	o	+ +
Additional TPB determinants			
Descriptive norm (aggregate)			+ + +
Descriptive norm (best friend)	+	o	
Descriptive norm (friends)		+	
Moral norm	+ + +	+	
Anticipated regret	– – –	o	+ + +
Habit			+ + + +
Positive expectations			
feel very good	+ +	o	
feel more connected	+	–	
make contact more easily	+	o	
understand oneself better	+	o	
have better sex	+	o	
get a lot of energy	+	o	
live a more intense life	+	–	
have a better life	+	–	
Negative expectations			
damage health	–	+ +	
feel bad for a few days	–	o	
feel nauseous	–	o	
get stiff jaws	o	o	

* The symbols + and – denote positive and negative associations with intention, respectively. One symbol denotes a weak association, two symbols a moderate association, three symbols a strong association, and four symbols a very strong association. Zeroes (o) indicate meaningless (trivial) associations; see [154].

deciding *how* to achieve that change. There are, however, theories that do. These are summarised in chapters 3 and 7 of Bartholomew et al. [2]. This book also offers guidance in continuing the intervention mapping process from here on. In brief, this would include discussing the matrices of change objectives with representatives of the target populations and the implementers, matching the change objectives to theoretical methods, devising practical strategies which are translations of these generic methods into practice, discussing these practical strategies with representatives of the target population and implementers, subsequently integrating these strategies into one coherent

program, and finally pilot testing and evaluating the program. The specific theoretical methods and practical strategies that will eventually be chosen are a function of the discussion with the target group and implementers, but also of other factors such as the specific program context and available resources.

Limitations of the reported studies

The studies reported in this thesis suffer several limitations. The meta-analysis was limited in its conclusions by the scarcity of quantitative research that addressed ecstasy use. Because only 10 publications were included, only a small number of studies with opposing effects could negate the conclusions. The qualitative review covered 22 publications, but the qualitative nature of this review precluded drawing conclusions regarding the relevance of the identified reasons. In addition, because these 22 publications covered a variety of behaviours, the literature base for each distinct behaviour was still limited. All in all, there was very little information available on ecstasy use to guide the empirical studies. This caused one of the limitations of the qualitative study reported in chapter 4. The scarcity of prior research necessitated gathering data on many different behaviours, limiting the data that could be gathered on any one behaviour.

The quantitative Party Panel study, results of which are reported in chapters 5, 6, 7, 8 and 9, suffers a similar limitation. Because of the paucity of prior research addressing the included behaviours, no information was available as to which variables were the most important to measure. Only the two theoretical perspectives identified in the meta-analysis were addressed (the Theory of Planned Behaviour and the expectation approach). Many potentially relevant theories could not be included, and consequently their role may remain unduly disregarded. This is the case both for social cognitive theories and for other theories and models that may help in explaining behaviour, such as theories with a focus on implicit processing. This narrow theoretical approach may have caused omission of important determinants. Especially concerning ceasing to use ecstasy, the low proportions of explained variation in intention certainly seem to point in this direction. Among potentially omitted determinants are external determinants: all studies addressed personal determinants, whereas environmental factors may play a role in determining behaviour as well. Especially for ceasing ecstasy use, there are indications that cessation is mainly prompted by environmental factors.

A second limitation of the Party Panel studies is two-fold: in retrospect, the combination of chosen follow-up time of three months and subsample size of 250-300 participants per subsample often led to situations where few people had performed the studied behaviour at follow-up. Larger subsamples or a longer time to follow-up would likely have resulted in more non-users that tried out ecstasy, more users that ceased ecstasy use, and more users that had their ecstasy tested. This would have allowed more thorough analyses of these groups.

A third limitation is related to the nature of the Theory of Planned Behaviour (TPB). Generally, the same TPB variables were measured for all behaviours. The items constituting these measurements used the exact same phrasing, to allow between-behaviour comparison of determinant configurations. However, when the TPB is applied with such consistency, problems occur in that not all TPB variables have been designed to be symmetrically applicable. For example, regarding ecstasy use cessation, one measures the intention to cease use, the attitude regarding cessation, the subjective norm regarding cessation, and the perceived behavioural control regarding cessation. Applying this model to trying out ecstasy, one measures the intention to try out ecstasy, the attitude regarding trying out ecstasy, the subjective norm regarding trying out ecstasy, and perceived behavioural regarding trying out ecstasy. However, perceived behavioural control regarding refraining from trying out ecstasy may have more predictive value. Therefore, to optimise explained variation in intention, it would have been better to not apply the same measurement model to the measurement of the TPB variables for the different behaviours. However, although this would probably have resulted in higher proportions of explained variation, it would also have made comparison of different determinant configurations less straightforward: for one behaviour, PBC over performing the target behaviour would have been measured; for another behaviour, PBC over *not* performing the target behaviour would have been measured.

A limitation that transcends the individual studies is the fact that results were only studied for young people in western society. Other cultures were deliberately excluded from the meta-analysis and the review, and all empirical data was collected from young people in western society. Although this deliberate exclusion of other cultural contexts was itself an acknowledgement of potential cultural differences, these differences were not examined, and

therefore it remains unclear whether the present results can generalise to other cultures.

The greatest limitation of the current thesis is a consequence of the combination of three things. First, there are many different ecstasy use-related behaviours; second, research into these behaviours lacks; and third, intervention on any given behaviour requires data on many determinants, measured at a very specific level. Ideally, all potentially relevant determinants are measured for all performance objectives. However, the studies reported in this thesis did not measure determinants of performance objectives, but of more broadly defined behaviours. In addition, not all potentially relevant determinants were measured, but only those that proved relevant in earlier research into using ecstasy. Even with these limitations, it would not have been possible to measure these data for all behaviours that were studied if it had not been possible to use the sophisticated tailoring that was possible because online questionnaires were used. And even in this situation, variables had to be measured so economically that this may have impaired reliability or validity. An alternative would have been to restrict all studies to one behaviour or even one performance objective. The chosen approach allows future research into many ecstasy use-related behaviours simultaneously, but the price to pay is likely lower explained variation of each of the addressed behaviours.

Implications for future research

Despite these limitations, the data reported in this thesis bear a number of implications for future research. With regards to ecstasy use specifically, four conclusions can be drawn. First, the results reported in this thesis clearly indicate that social cognitive theories can play a valuable role in explaining ecstasy use and related behaviours. Second, future research into ecstasy use should strive to address additional determinants. This means integrating more theoretical perspectives and including determinants based on reasons reported in qualitative research. Third, concrete behaviours such as 'ceasing ecstasy use' and 'trying out ecstasy' or 'starting ecstasy use' should be targeted by studies aiming to inform intervention development, rather than the more abstract behaviour of 'using ecstasy'. Fourth, as ecstasy use appears to be a phase that ends automatically for most people, it appears more urgent to identify the determinants of harm reduction strategies than to identify the determinants of ceasing ecstasy use. Thus, research into ecstasy use should address harm

reduction strategies, measuring constructs from the Theory of Planned Behaviour, expectancies, and determinants based on the qualitative research thus far, all related to concrete and specific behaviours (rather than, for example, the generic 'applying harm reduction strategies').

Four additional conclusions transcend ecstasy-use related research. First, meta-analyses cannot be considered sufficient tools in synthesising the literature: they need to be complemented with qualitative reviews. By virtue of their strict quantitative approach, meta-analyses provide only a very narrow view into the literature, excluding many studies that may provide valuable pointers for future research. By considering these excluded studies, qualitative reviews remain very valuable tools in synthesising the state of the literature. Second, conclusions from such qualitative reviews need to be quantitatively verified. As was also the case in the current review, results from qualitative research may not be corroborated by quantitative data. Thus, a balanced synthesis of the state of the art requires both meta-analytical and qualitative reviews.

A second and related conclusion is that in general, neither quantitative nor qualitative methods can suffice in mapping a behaviour's determinant configuration. Qualitative studies are required to explore which beliefs may be relevant to determine a behaviour. Quantitative studies can then address the relative relevance of each of these beliefs and overarching variables. Thus, neglecting qualitative research may result in determinant configurations that omit relevant determinants, whereas without quantitative research, it remains unknow which determinants are the most relevant in predicting behaviour. The current thesis reports both literature overviews and empirical studies, and of each type, both qualitative and quantitative studies. Every study has yielded results that would have remained obscured without application of that particular combination of methodologies. Thus, for future research into behavioural determinants, it is certainly advised to utilise these same tools.

Third, determinant configurations should be considered behaviourally specific. Thus, when aiming to inform intervention development, studies should address behaviours that are the intervention targets of such an intervention. Determinant configurations of trying out a drug and of ceasing to use a drug have to be measured and analysed separately. Similarly, determinant configurations of exercising physical activity once or twice and of maintaining such exercise over time may very well differ, and each of these determinant configurations could be different from the determinant

configuration of the more abstract behaviour 'exercising a physical activity'. It is important to measure a behaviour and the determinants of that behaviour as specifically as possible.

Fourth, the current studies show the possibilities of online research. It is possible to develop questionnaires that activate the proper context for participants, only present relevant items, and employ powerful tailoring strategies to gather data on a host of different behaviours or issues in one questionnaire. These possibilities are especially valuable for health promotion research, as intervention development often requires information on many different determinants of many different performance objectives. The strengths of such designs can be harnessed to a greater degree if combined with statistical methods such as mixed regression, where different participants can supply data on different predictors in a regression model. This theoretically enables collecting data on random subsets of determinants and performance objectives in one large sample.

Concluding remarks

The second and third chapters of this thesis evidence the complementary nature of meta-analyses and qualitative reviews, thereby emphasizing the value of each method. In addition, the third chapter indicated that reasons for related but distinct behaviours may differ, and that ecstasy use seems to end automatically for most users. This was confirmed by the qualitative study reported in the fourth chapter, where the application of these findings to the Dutch situation was confirmed as well. The data reported in the fifth, sixth, seventh and eighth chapters are the first to address the distinction of trying out ecstasy, ceasing ecstasy use and using ecstasy, a distinction that indeed proves fruitful. Finally, in the ninth chapter, the results of the first study into the determinants of an ecstasy use-related harm reduction strategy are reported. These studies yielded several conclusions, three of which have particularly general implications. First, research into behavioural determinants should complement qualitative and quantitative methodologies. This applies not only to empirical research, but also to literature syntheses. Second, determinant configurations should be considered behaviourally specific. Determinants of a behaviour need not be the same for related behaviours. Similarly, the determinants that predict behaviour among people who regularly perform that behaviour (e.g. ecstasy users) can be different determinants than those that

predict the same behaviour among people who do not regularly perform that behaviour (e.g. non-users). Also, determinants that differentiate between such groups need not predict intention in either of those groups. Finally, ecstasy use interventions should aim at promoting harm reduction, rather than abstinence. Because most ecstasy users appear to cease of their own accord, more health benefits can be achieved by promoting consistent application of harm reduction strategies than by promoting abstinence.

Appendix 10.i: the information architecture of the content management system that underlied Party Panel.

Participant →

Browser shows a Flash application where a self-chosen interviewer interacts with and asks questions to the participants to a background of photographs of dance events while dance music is playing.

Webserver encodes questions, interviewer lines, and onscreen information in XML and sends them to the browser

Flash application encodes answers in XML and sends them to the webserver

PHP stores the answers in the MySQL database, and retrieves new information and questions on the basis of these answers

MySQL database

PHP file retrieves questions and details of each question from MySQL databse, integrates these in HTML pages and sends those to the browser

Browser shows HTML pages that allow the researcher to edit questions, add questions, determine the conditions for the questions, and download the answers that the participants provided

Researcher →